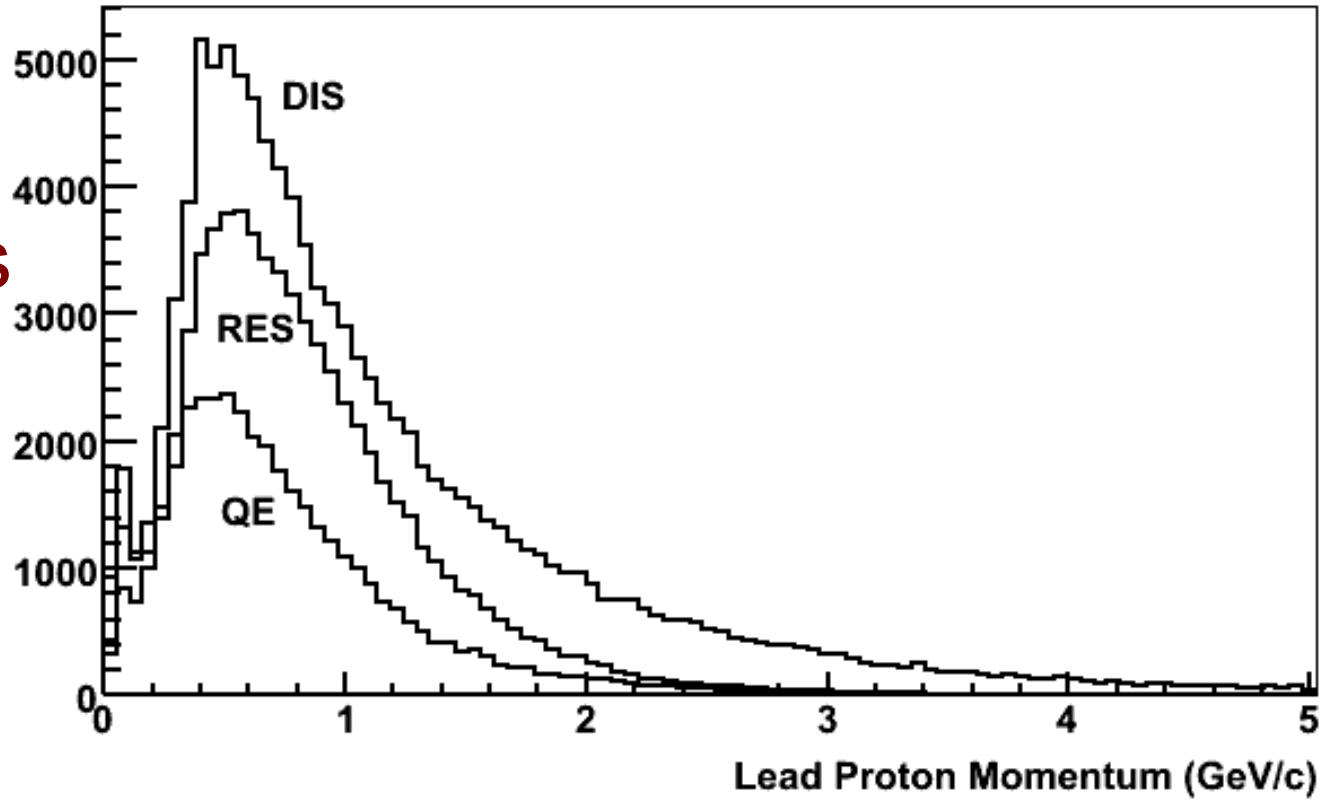
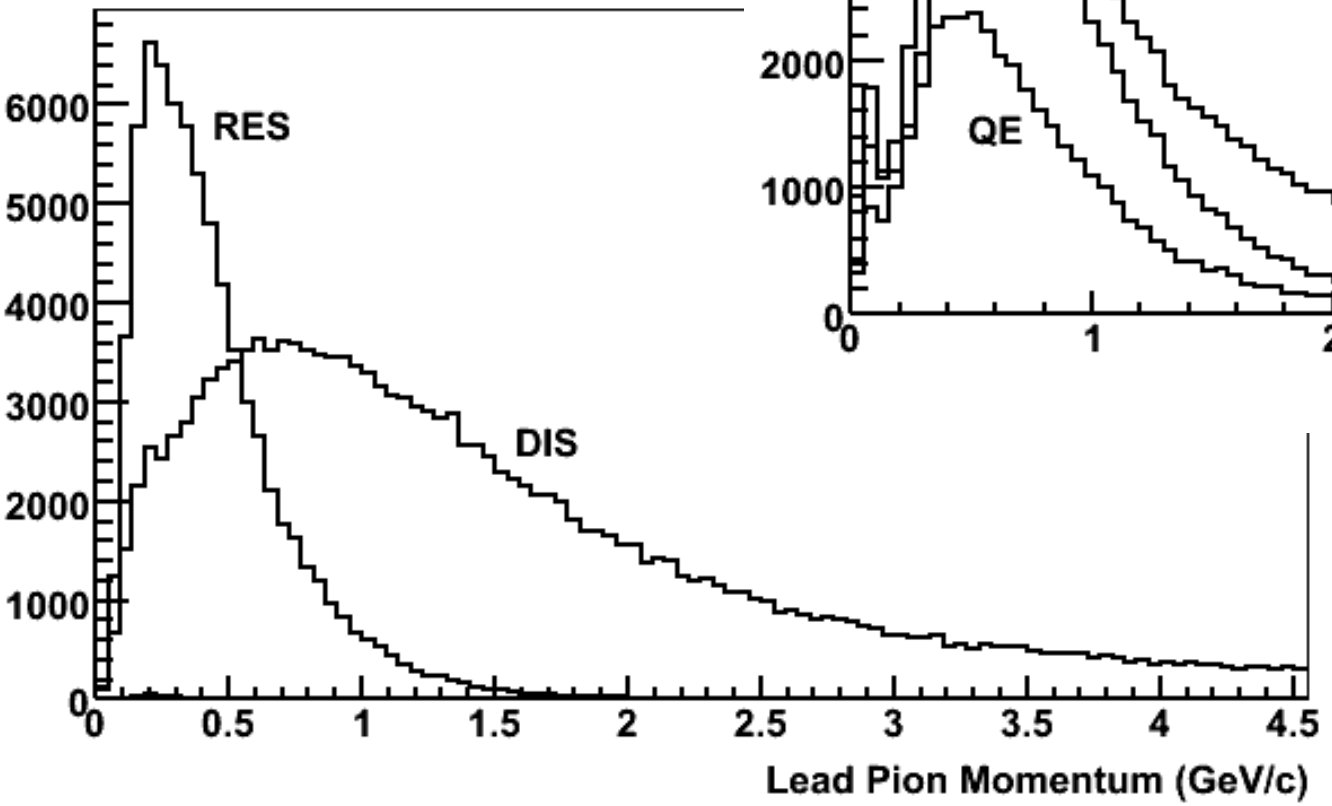
MINERvA test beam efforts

Rik Gran, University of Minnesota Duluth

Predicted Hadron Momentum spectra from NuMI neutrinos





from NEUGEN neutrino model NuMI LE beam

Talk for All Experimenter's Meeting, 10 November 2008

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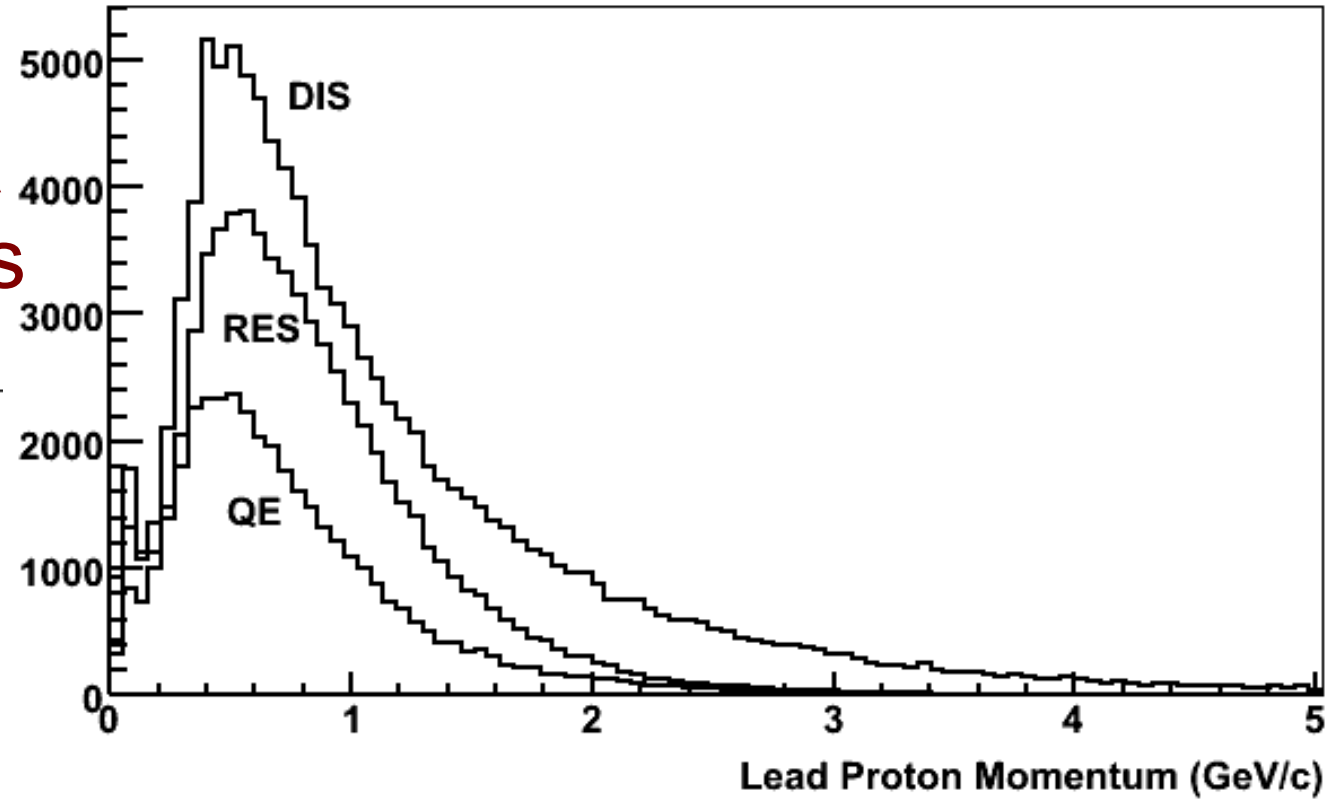

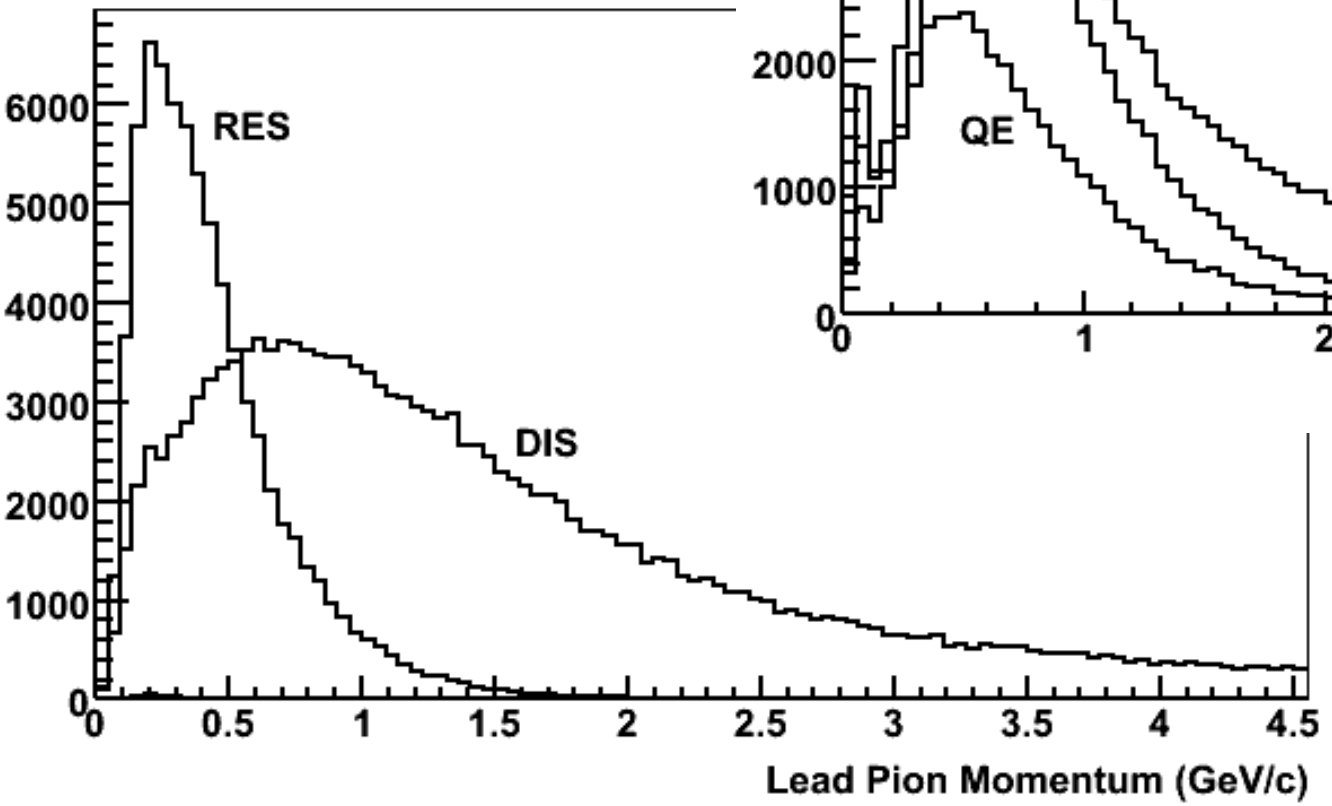

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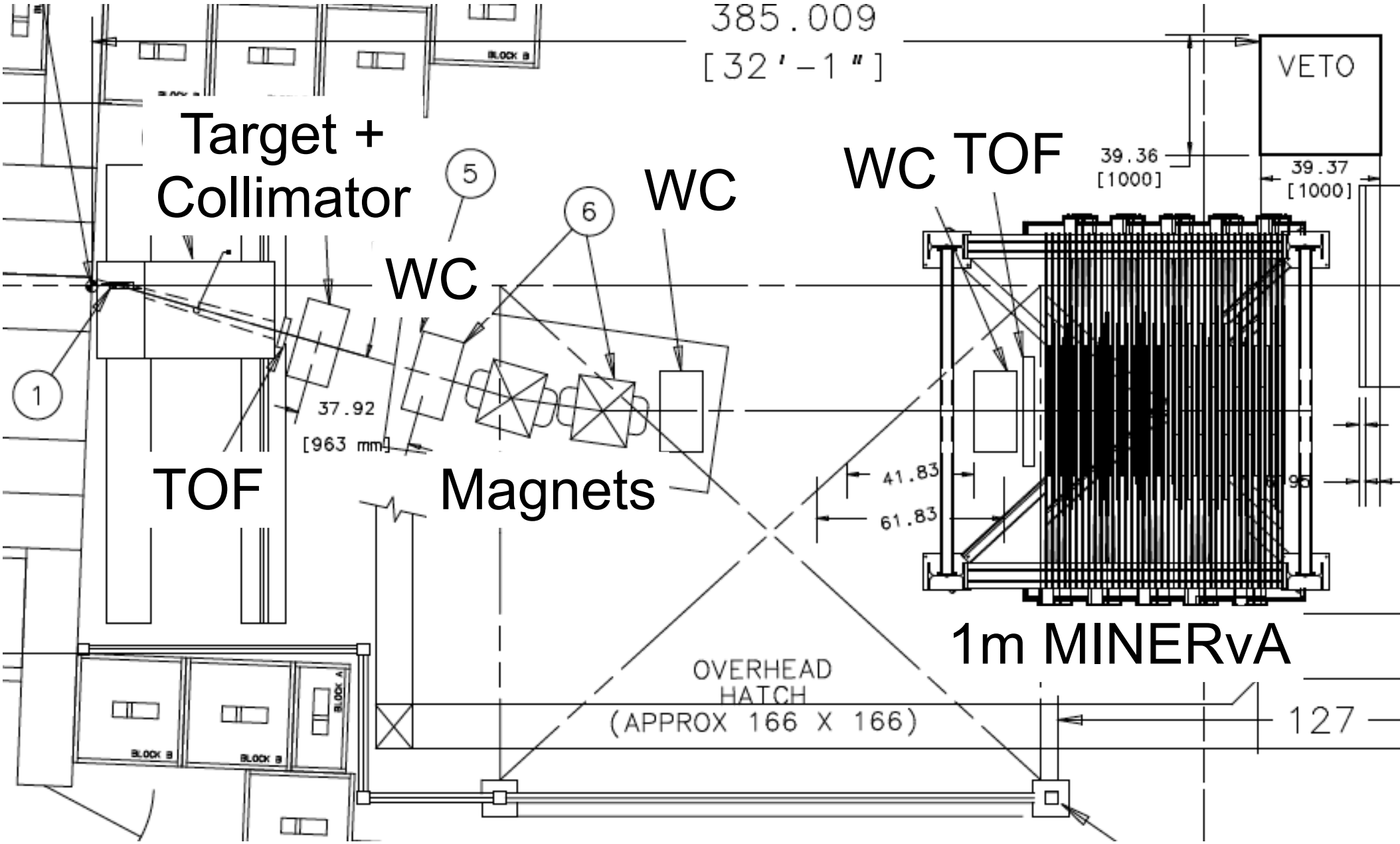
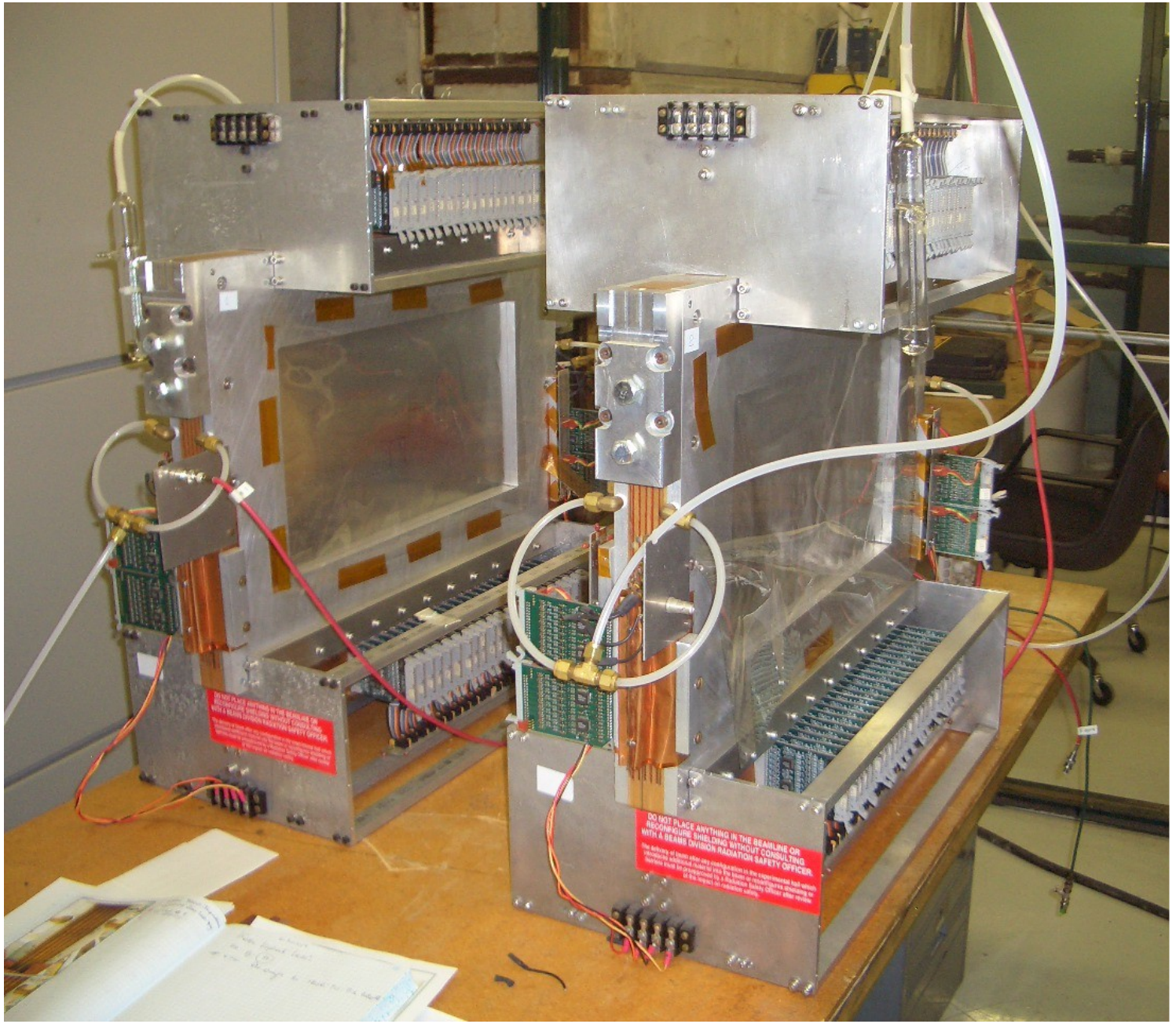
Build a tertiary beamline here at MTest




Two of these magnets
NDB021
CAUTION
RADIATION
AREA

Updated Beamline Instrumentation



Refurbish the HyperCP Chambers

Large area, high efficiency

Also larger area downstream time-of-flight

WC testing with cosmics is imminent. TOF testing underway.

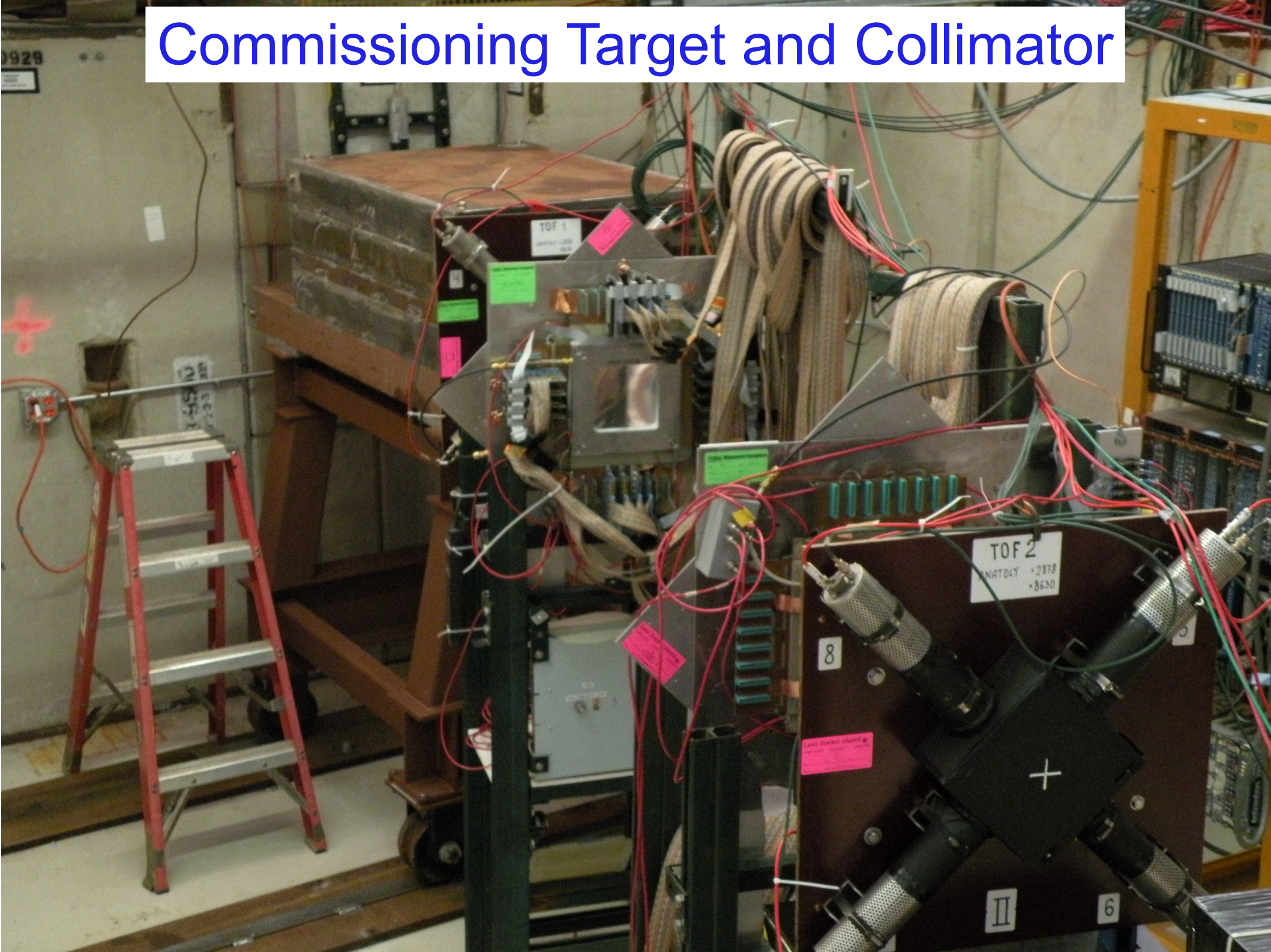
Commissioning Target and Collimator

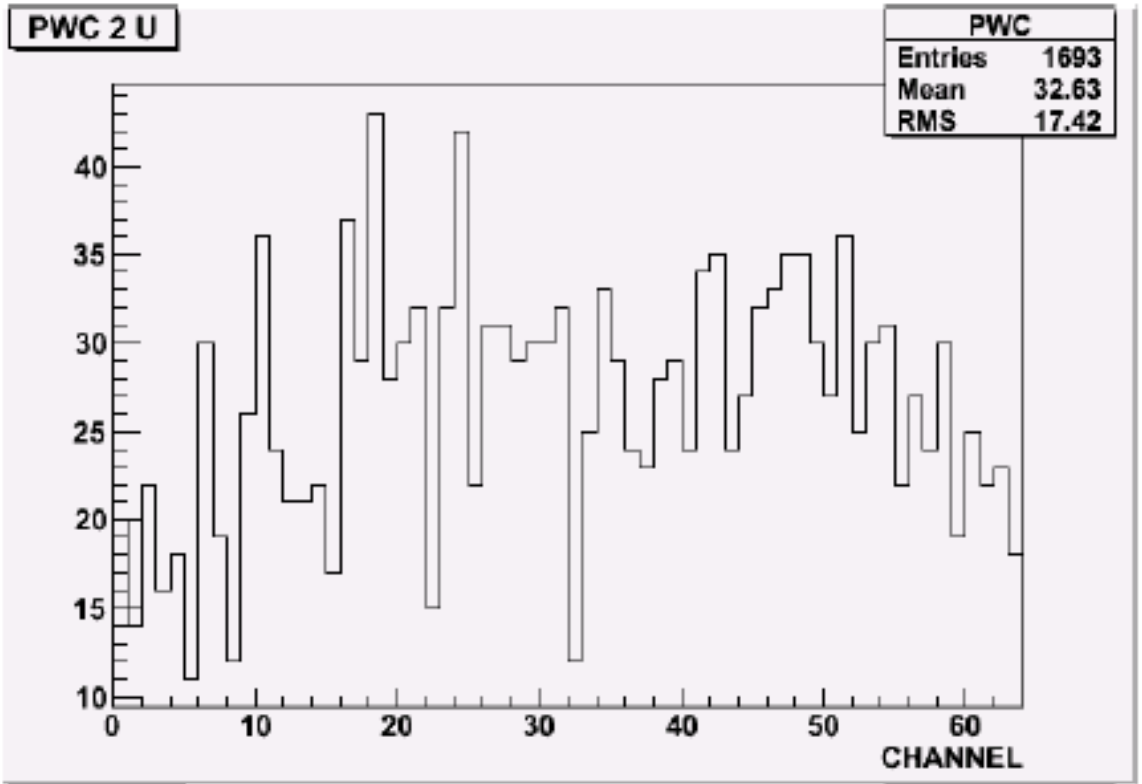
Copper target with collimator aperture at 16^{o}

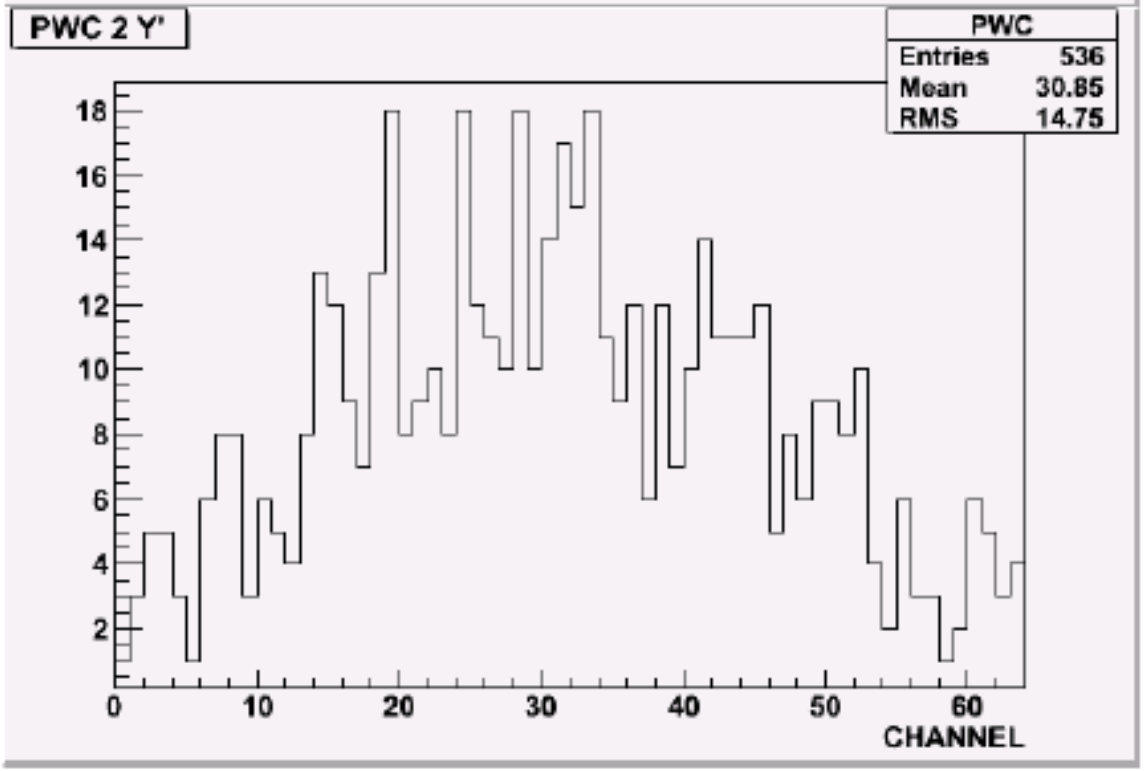
Now completing a couple weeks in Mtest
Without magnets.


Bottom half of the collimator during construction
(beams eye view)
FRAGILE

Commissioning Target and Collimator





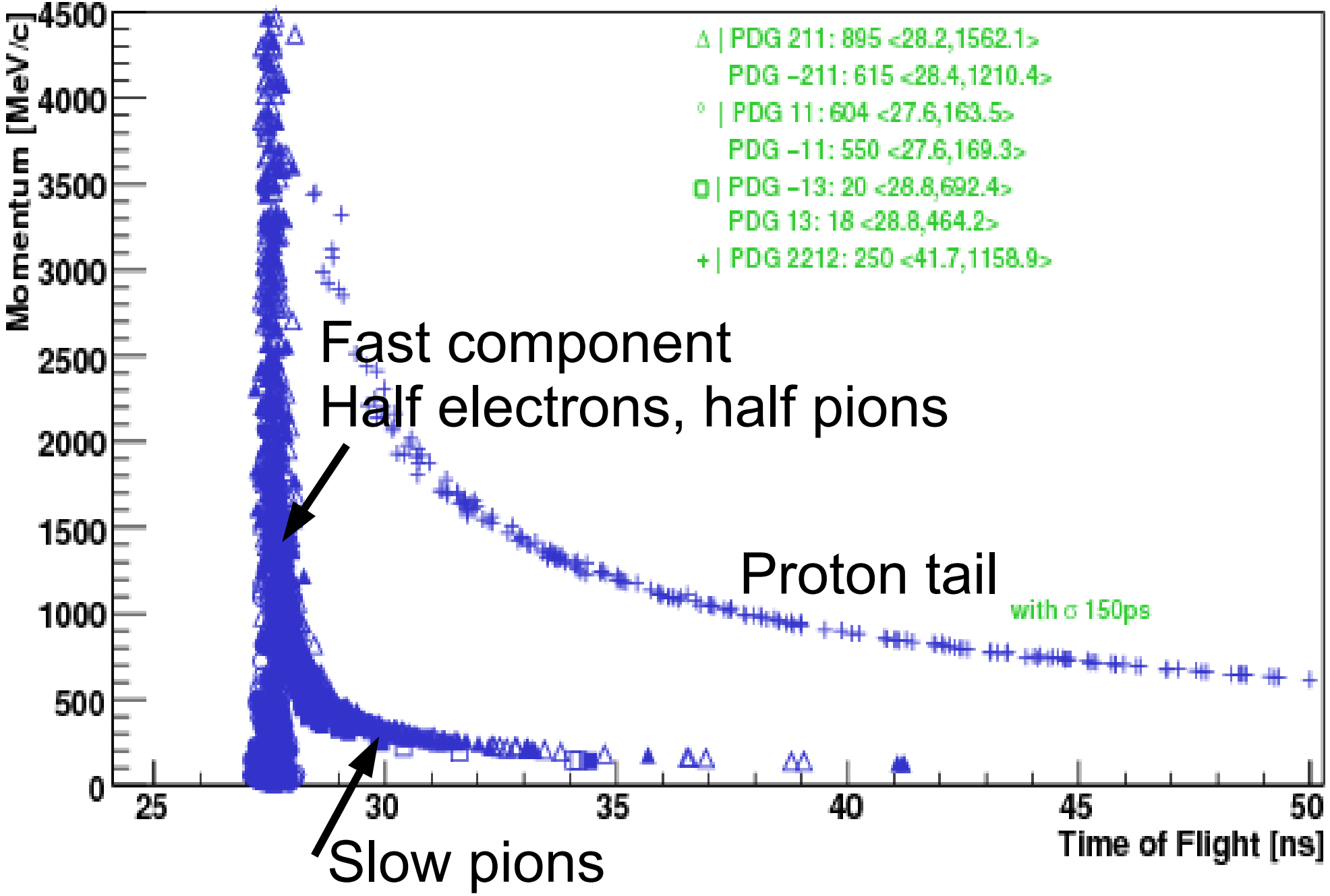


Tertiary Beam Profiles

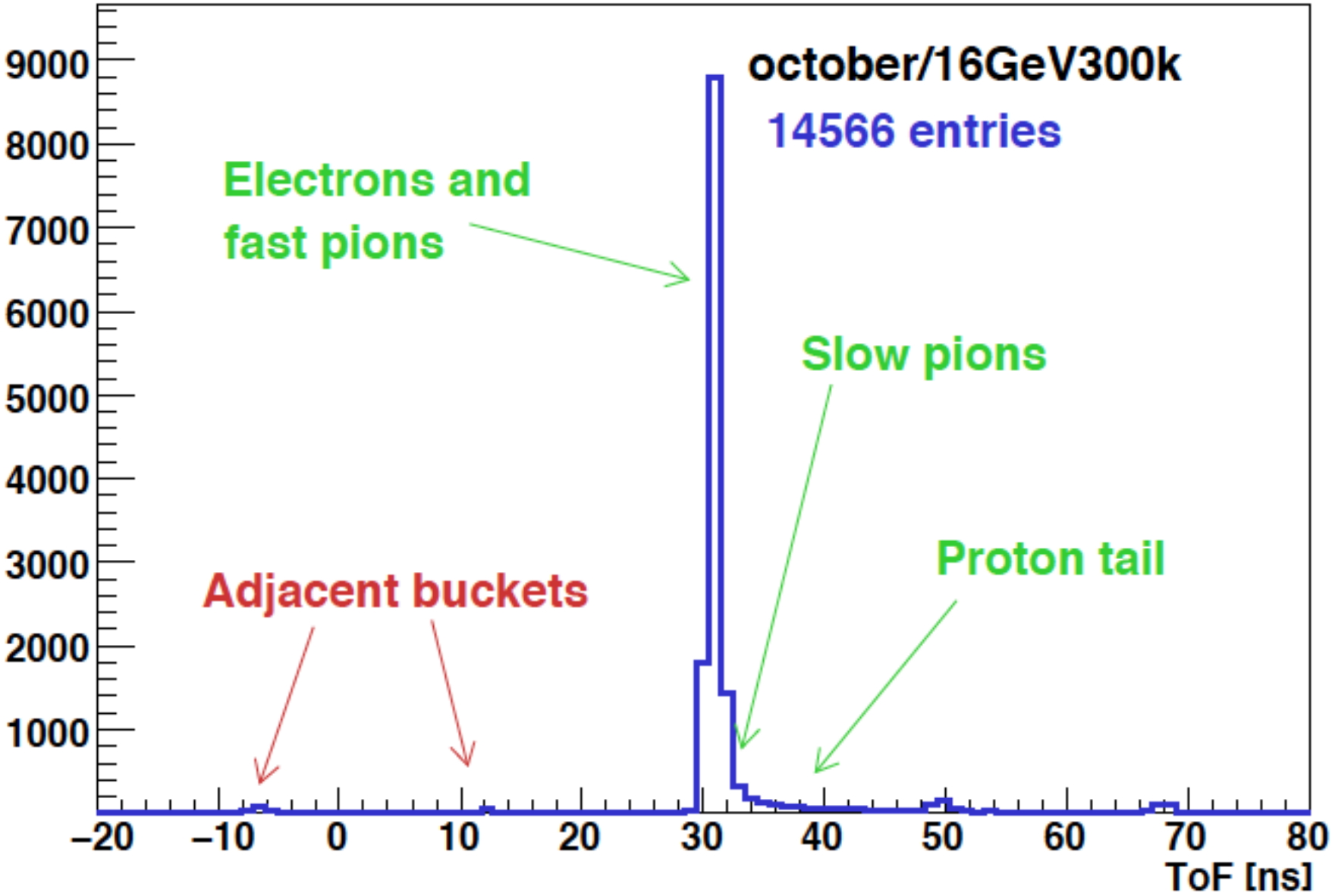
From the Fenker chambers

Second unit

Prediction for this beam

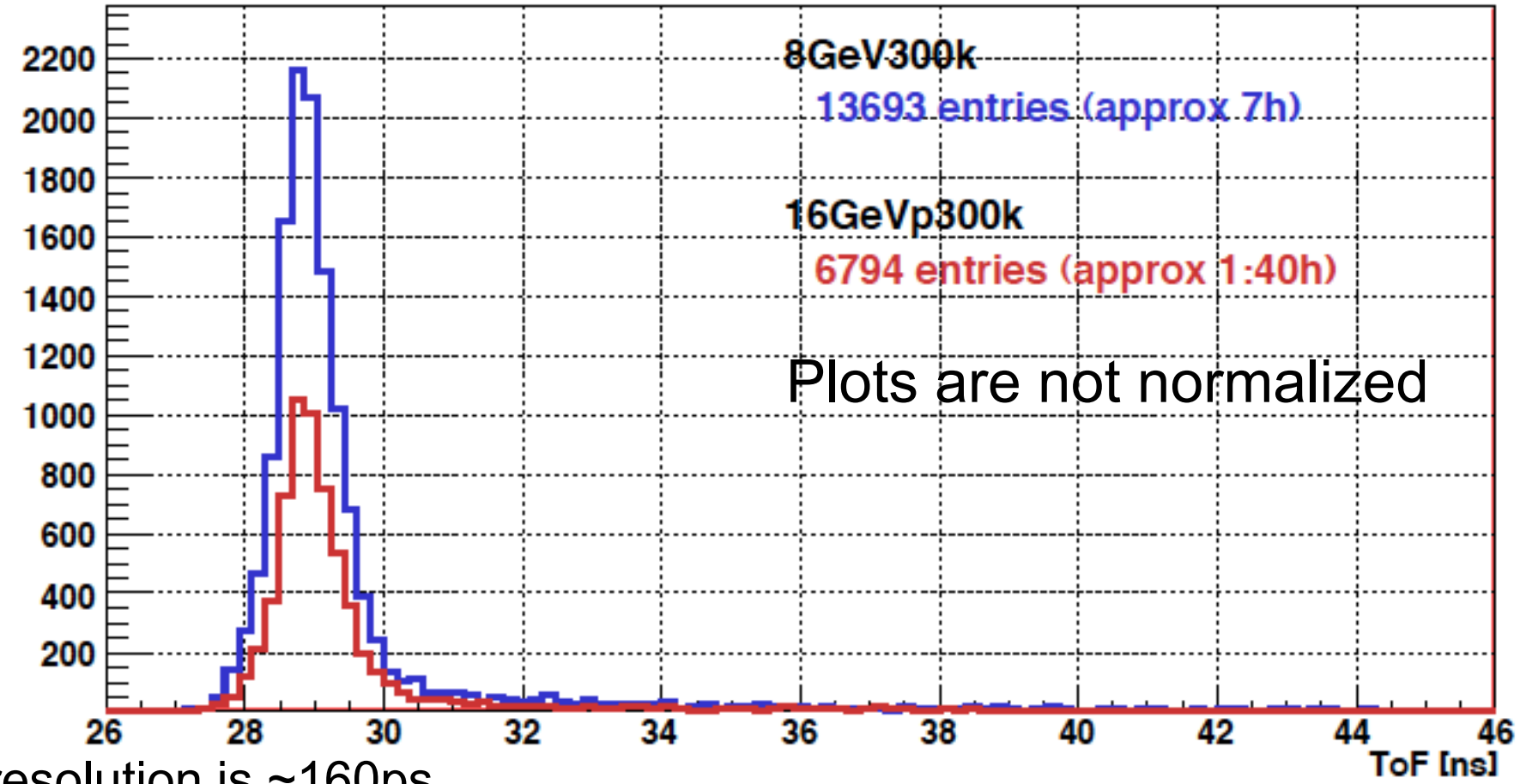


Measured TOF spectrum

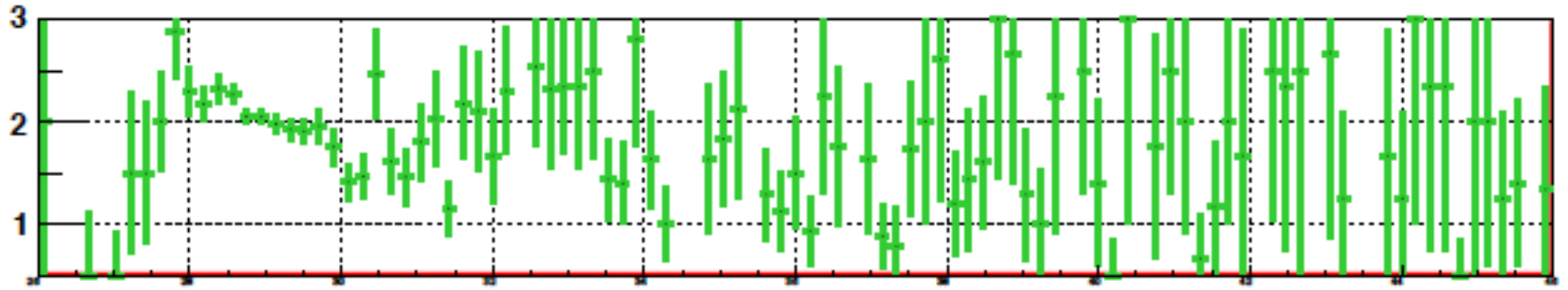


Approximate cable delays are corrected, TOF resolution is ~160ps

Compare 8GeV/c to 16GeV/c on target

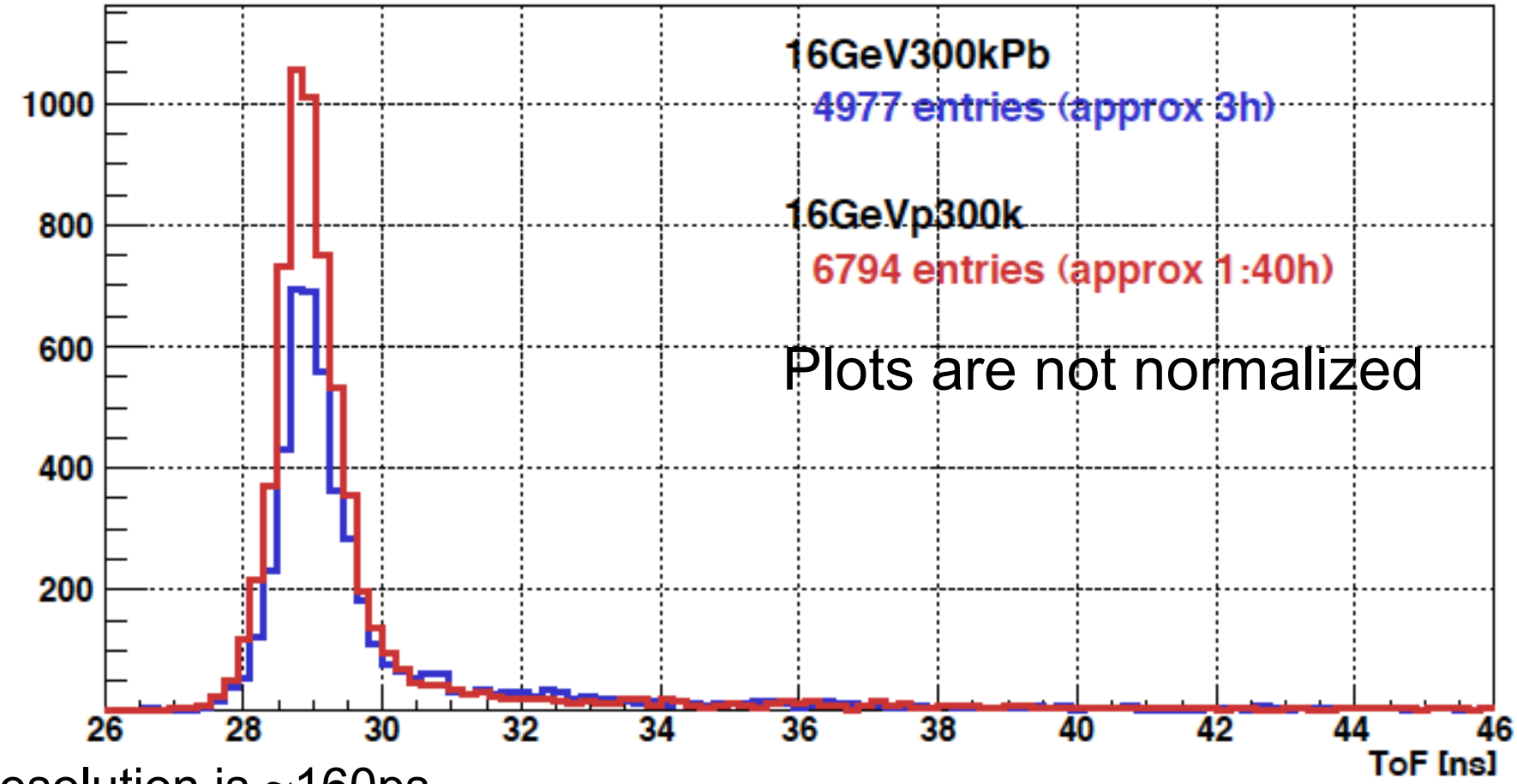


TOF resolution is ~160ps



Absolute and relative pion yield is higher at 16 GeV/c

Compare with and without 1.5cm Pb at 16 GeV/c



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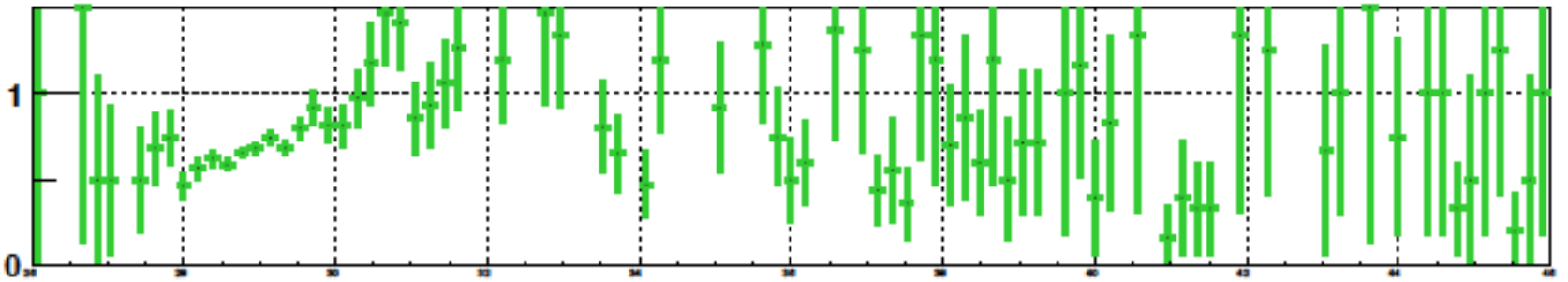
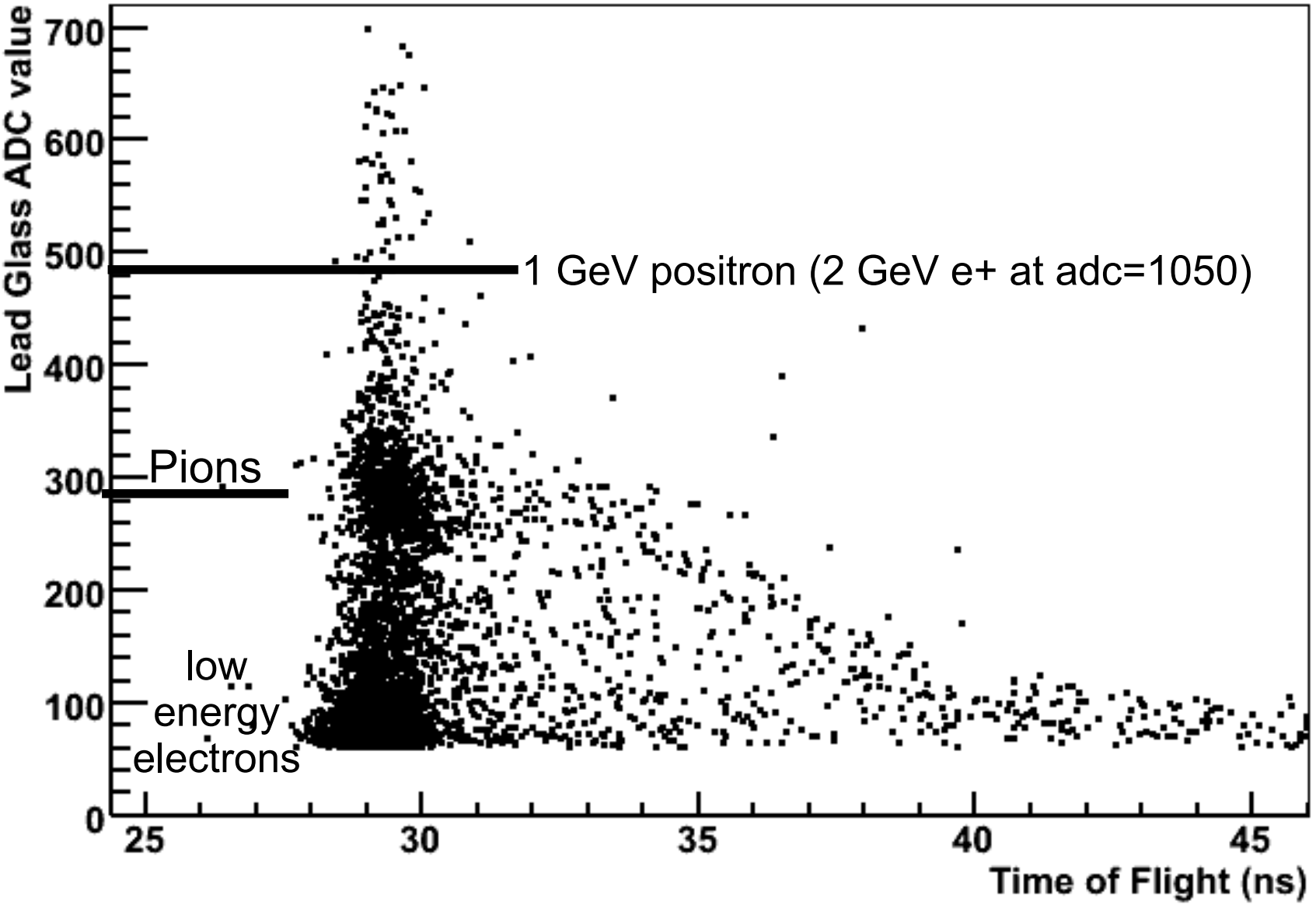


Significant suppression of the fast electron component

We have a Pb-Glass block behind TOF2



Data from 16 GeV tertiary beam,
e+, pi+ labels are from Pb-Glass calibration

Conclusions, and work ahead

Drafting and building magnet stands now.
Commission magnets, momentum measurement commission December/January

Much of the 1m MINERvA detector is ready, but waiting for the scintillator planes.
Engineering run with four planes, followed by physics run.

Tertiary beam becomes part of the MTest facility.

Thanks to many

Accelerator division including Rick Coleman, Chuck Brown and the helpful MCR folks.

Rad Safety folks including Roger Zimmerman

Jim Kilmer and his crew

MTest folks: Erik Ramberg, Doug Jensen, Todd Nebel, Anatoli Ronzhin

MINERvA test beam crew, especially our shift folks

Aaron Higuera, Bruno Gobbi, Carlos Perez, Carmen Araujo, Dave Boehnlein, Julian Felix Lee Patrick, Paul Rubinov, Zaidy Urrutia